

B' an active layer formed over said first cladding layer; and
a second cladding layer formed over said active layer.

Please add the following new claims:

45. (New) A semiconductor device comprising:

a substrate;

crystals formed on said substrate and containing at least Al and N, said crystals being loosely formed on said substrate;

a thermal distortion reducing layer made of $Al_{1-u-v}Ga_uIn_vN$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$, $u+v \leq 1$) formed on said crystals and having a different chemical formula from that of said crystals;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer.

46. (New) The semiconductor device according to claim 45, wherein said crystals consist essentially of an AlGaN material.

47. (New) The semiconductor device according to claim 45, wherein said thermal distortion reducing layer consists essentially of a GaN material.

48. (New) A semiconductor device comprising:

a substrate;

crystals formed on said substrate and containing at least Al and N, said crystals being formed spaced apart;

a thermal distortion reducing layer made of $Al_{1-u-v}Ga_uIn_vN$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$, $u+v \leq 1$) formed on said crystals and having a different chemical formula from that of said crystals;

a first cladding layer formed over said thermal distortion reducing layer;

sub 1 → an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer.

49. (New) The semiconductor device according to claim 48, wherein said crystals consist essentially of an AlGa_N material.

50. (New) The semiconductor device according to claim 48, wherein said thermal distortion reducing layer consists essentially of a GaN material.

51. (New) A semiconductor device comprising:

a substrate;

crystals formed on said substrate and containing at least Al and N, said crystals having intervals therebetween so as to expose said substrate;

B2 a thermal distortion reducing layer made of $Al_{1-u-v}Ga_uIn_vN$ ($0 \leq u < 1$, $0 \leq v < 1$, $u+v < 1$) formed on said crystals and having a different chemical formula from that of said crystals;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer.

52. (New) The semiconductor device according to claim 51, wherein said crystals consist essentially of an AlGa_N material.

53. (New) The semiconductor device according to claim 51, wherein said thermal distortion reducing layer consists essentially of a GaN material.

sub 5 → 54. (New) A semiconductor device comprising:

a buffer layer comprising a first layer made of $Al_{1-s-t}Ga_sIn_tN$ ($0 \leq s \leq 1$, $0 \leq t \leq 1$, $s+t \leq 1$) and a second layer made of $Al_{1-u-v}Ga_uIn_vN$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$, $u+v \leq 1$) formed on said first layer and having a chemical formula from that of said first layer;

a first cladding layer formed over said second layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer,

wherein said first layer comprises pinholes

2nd 0.1 → 55. (New) The semiconductor device according to claim 54, wherein said first layer consists essentially of an AlGa_N material, and said second layer consists essentially of a Ga_N material.

56. (New) A semiconductor device comprising:

a substrate

B2 a buffer layer comprising a first layer made of Al_{1-s-t}Ga_sIn_tN (0 ≤ s ≤ 1, 0 ≤ t ≤ 1, s+t ≤ 1) formed on said substrate, and a second layer made of Al_{1-u-v}Ga_uIn_vN (0 ≤ u ≤ 1, 0 ≤ v ≤ 1, u+v ≤ 1) formed on said first layer and having a different chemical formula from that of said first layer;

a first cladding layer formed over said second layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer,

wherein said first layer comprises crystals formed on said substrate, said crystals comprising intervals therebetween exposing said substrate.

57. (New) The semiconductor device according to claim 56, wherein said first layer consists essentially of an AlGa_N material, and said second layer consists essentially of a Ga_N material.

58. (New) A semiconductor device comprising:

a substrate;

a buffer layer comprising a first layer made of Al_{1-s-t}Ga_sIn_tN (0 ≤ s ≤ 1, 0 ≤ t ≤ 1, s+t ≤ 1) formed on said substrate, and a second layer made of Al_{1-u-v}Ga_uIn_vN (0 ≤ u ≤ 1, 0 ≤ v ≤ 1, u+v ≤ 1) formed on said first layer and having a different chemical formula from that of said first layer;

a first cladding layer formed over said second layer;
an active layer formed over said first cladding layer; and
a second cladding layer formed over said active layer,
wherein said first layer comprises crystals formed spaced apart.

59. (New) The semiconductor device according to claim 58, wherein said first layer consists essentially of an AlGa_N material, and said second layer consists essentially of a Ga_N material.

60. (New) A semiconductor device comprising:

a substrate;

a buffer layer comprising a first layer made of Al_{1-s-t}Ga_sIn_tN (0 ≤ s ≤ 1, 0 ≤ t ≤ 1, s+t ≤ 1) formed on said substrate, and a second layer made of Al_{1-u-v}Ga_uIn_vN (0 ≤ u ≤ 1, 0 ≤ v ≤ 1, u+v ≤ 1) formed on said first layer and having a different chemical formula from that of said first layer;

a first cladding layer formed over said second layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer,

wherein said first layer comprises crystals disposed so as to expose portions of said substrate.

61. (New) The semiconductor device according to claim 60, wherein said first layer consists essentially of an AlGa_N material, and said second layer consists essentially of a Ga_N material.

62. (New) A semiconductor device comprising:

a substrate;

a buffer layer comprising a first layer made of Al_{1-s-t}Ga_sIn_tN (0 ≤ s ≤ 1, 0 ≤ t ≤ 1, s+t ≤ 1) formed on said substrate, and a second layer made of Al_{1-u-v}Ga_uIn_vN (0 ≤ u ≤ 1, 0 ≤ v ≤ 1, u+v ≤ 1)

formed on said first layer and having a different chemical formula from that of said first layer;

a first cladding layer formed over said second layer; and

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer,

wherein said first layer comprises crystals loosely formed on said substrate.

63. (New) The semiconductor device according to claim 62, wherein said first layer consists essentially of an AlGaN material, and said second layer consists essentially of a GaN material.

64. (New) A semiconductor device comprising:

a buffer layer made of $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$ ($0 \leq s \leq 1, 0 \leq t \leq 1, s+t \leq 1$);

a thermal distortion reducing layer made of $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$ ($0 \leq u \leq 1, 0 \leq v \leq 1, u+v \leq 1$)

formed on said buffer layer and having a different chemical formula from that of said buffer layer;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer,

wherein said buffer layer comprises crystals formed on said substrate, said crystals having intervals therebetween so as to expose said substrate.

65. (New) The semiconductor device according to claim 64, wherein

said buffer layer consists essentially of an AlGaN material, and

said thermal distortion reducing layer consists essentially of a GaN material.

66. (New) A semiconductor device comprising:

a substrate;

a buffer layer made of $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$ ($0 \leq s \leq 1, 0 \leq t \leq 1, s+t \leq 1$) formed on said substrate;

a thermal distortion reducing layer made of $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$ ($0 \leq u \leq 1, 0 \leq v \leq 1, u+v \leq 1$)
formed on said buffer layer and having a different chemical formula from that of said buffer
layer;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer,

wherein said buffer layer comprises crystals formed spaced apart on said substrate.

67. (New) The semiconductor device according to claim 66, wherein

said buffer layer consists essentially of an AlGaIn material, and

said thermal distortion reducing layer consists essentially of a GaN material.

68. (New) A semiconductor device comprising:

a substrate;

a buffer layer made of $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$ ($0 \leq s \leq 1, 0 \leq t \leq 1, s+t \leq 1$) formed on said substrate;

a thermal distortion reducing layer made of $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$ ($0 \leq u \leq 1, 0 \leq v \leq 1, u+v \leq 1$)
formed on said buffer layer and having a different chemical formula from that of said buffer
layer;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer,

wherein said buffer layer comprises crystals disposed so as to expose portions of said
substrate.

69. (New) The semiconductor device according to claim 64, wherein

said buffer layer consists essentially of an AlGaIn material, and

said thermal distortion reducing layer consists essentially of a GaN material.

70. (New) a semiconductor device comprising:

a substrate;

a buffer layer made of $\text{Al}_{1-s-t}\text{Ga}_s\text{In}_t\text{N}$ ($0 \leq s \leq 1$, $0 \leq t \leq 1$, $s+t \leq 1$) formed on said substrate;

a thermal distortion reducing layer made of $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$, $u+v \leq 1$) formed on said buffer layer and having a different chemical formula from that of said buffer layer;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed on said first cladding layer; and

a second cladding layer formed on said active layer,

wherein said buffer layer comprises crystals loosely formed on said substrate.

71. (New) The semiconductor device according to claim 70, wherein said buffer layer consists essentially of an AlGaIn material, and

said thermal distortion reducing layer consists essentially of a GaN material.

72. (New) A semiconductor device comprising:

a substrate;

crystals formed on said substrate and containing at least Al and N;

a thermal distortion reducing layer made of $\text{Al}_{1-u-v}\text{Ga}_u\text{In}_v\text{N}$ ($0 \leq u \leq 1$, $0 \leq v \leq 1$, $u+v \leq 1$) formed to contact said crystals and said substrate and having a different chemical formula from that of said crystals;

a first cladding layer formed over said thermal distortion reducing layer;

an active layer formed over said first cladding layer; and

a second cladding layer formed over said active layer.

73. (New) The semiconductor device according to claim 72, comprising: